



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No. : 10/783,793  
Applicant : Copeland, Stephan  
Filed : February 20, 2004  
Title : MECHANICAL ARM WITH SPRING COUNTERBALANCE  
:  
Group Art Unit : 3532  
Examiner : Anita M. King  
:  
Docket No. : 030685

**BRIEF ON APPEAL**

**Real Party in Interest**

The real party of interest is Knoll, Inc., of 1235 Water Street, East Greenville, PA 18041.

**Related Appeals and Interferences**

There are no related appeals, interferences or judicial proceedings.

**Status of Claims**

Claims 1-13 are currently pending in the application. Claims 1- 2, and 7-10 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,682,749 (Sträter). Claim 11 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Sträter in view of U.S. Patent No. 5,108,061 (Vlasak), U.S. Patent No. 4,447,031 (Souder, Jr. et al.) or U.S. Patent No. 6,550,734 (Spadea). Claims 3-6 and 12 have been objected to as being dependent upon a rejected base claim, but the Examiner indicates that these claims would be allowable if rewritten in independent form. All currently pending claims are the subject of this appeal. The claims on appeal are reproduced in the claims appendix.

### **Status of Amendments**

No amendments were filed after the final rejection.

### **Summary of the Claimed Subject Matter**

The present invention is directed to a mechanical arm for holding objects such as lamps, computer screens, laboratory instruments and other items (Specification, paragraph [02]). The arm has two portions pivotably linked together wherein the force required by the user to adjust the position of the arm is minimized and the force exerted by the counterbalance springs is more constant over the entire range of motion or both arms of the device. (Specification, paragraph [09]). The design features circular pivots connecting a first portion to a base and a second portion to a first portion wherein the circular pivots serve as an axel for an internal ring mechanism which is used to anchor one end of the counterbalancing springs of the arms via a cable which is wound around the ring as the arms arte portions are moved with respect to each other, thereby allowing more constant force to be exerted by the spring regardless of the position of the arm with respect to a horizontal reference. (Specification, paragraph [10]).

### **Grounds of Rejection to Be Reviewed on Appeal**

1. Whether Claims 1-2 and 7-10 are patentable under 35 U.S.C. § 102(b) over U.S. Patent No. 4,682,749 (Sträter).

2. Whether Claim 11 is patentable under 35 U.S.C. § 103(a) over a combination of Sträter and any one of U.S. Patent Nos. 5,108,061 (Vlasak), 4,447,031 (Souder, Jr. et al.) or 6,550,734 (Spadea).

### **Argument**

#### **I. Claims 1-2, and 7-10 are patentable over Sträter.**

The Examiner has rejected claims 1-2 and 7-10 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,682,749 (Sträter). The Examiner states that all elements of these claims are disclosed by Sträter. The Applicant respectfully disagrees with the Examiner's conclusions regarding the similarities between Sträter and the present invention.

In general, Sträter discloses an articulated arm (for supporting a copyholder) having two linkages wherein the linkages are prevented from moving with respect to each other by brake shoes which are present at the pivot points between the linkages. The brake shoes are composed of a segmented ring having one gap therein such as to allow the ring to be expanded when the ends of the gap are pushed away from each other, thereby engaging the brake. The outside edge of the ring (brake shoe) is frictionally engaged with a stationary surface located concentrically therewith to prevent pivoting of the linkages about the pivot points when the brake is engaged. The brake is engaged or disengaged by forcing the gap in the segmented brake shoe to become larger or smaller utilizing an oval-shaped element having a long and short axis which is rotated in the gap

to bring about the change in the geometry of the brake shoe. The oval-shaped element responsible for expanding the gap in the brake shoe is rotated by means of a cable which is actuated by the user of the device.

The Applicant will now discuss the differences between the device in Sträter as cited by the Examiner, and the present invention. As with the present invention, the device of Sträter discloses a mechanical arm having first and second linkages wherein the first linkage is attached to the base at a first pivot (8) and the first linkage is pivotally attached to the second linkage at a second pivot (9). The Examiner then states that Sträter discloses a first spring (25) attached between an anchor point (30) defined on the first linkage and the first pivot and a second spring (25) attached between an anchor point (30) defined on the second linkage and the second pivot.

This arrangement is distinguishable from the mechanical arm of Claim 1 of the present invention. Claim 1 of the present invention contains the limitation that "the first spring is attached between an anchor point defined on the first linkage and the first pivot point." The first spring (25) in Sträter, however, is attached neither to the first linkage (5) nor to the first pivot point (8). Instead the springs in both linkages in Sträter are compressively held in place by shoulders defined on twin segmented guide rods whose individual guide rod segments (26 and 27) are in telescoping engagement with each other. The Applicant directs the Board's attention to a paragraph describing this in Sträter which begins at column 6, line 29 and ends at column 6, line 35 and which states as follows:

The coil compression springs 25 are slotted on twin segmented guide rods whose individual guide rod segments 26 and 27 are in telescoping engagement with each other. At both ends of the guide

rod on the individual guide rod segments 26 and 27 shoulders are provided on which the coil spring 25 is braced in a partially compressed or prestressed position.

The purpose of the spring in Sträter is to push the guide rod segments apart from each other. One of the guide rod segments (27) is attached to the linkage and the other guide rod segment (26) is attached to what Sträter refers to as a turning lever (23) which is in turn pivotally attached to the oval-shaped element (21) which is responsible for spreading the brake shoe. The object of the spring is to hold the oval-shaped element (21) in a rotated position such that its long axis occupies the gap in brake shoe (19) such that the brake shoe is frictionally engaged with circular grooves 18, thereby preventing the linkages from moving.

This is different from both the structure and the purpose of the springs in the present invention. In the present invention the springs are connected directly between the linkages and the circular axles in each pivot point, with the theory being that, as the linkages are rotated, the spring will wrap around the axles at the pivot points, thereby providing a variable resistance depending upon the position of the linkages with respect to the pivot points. The spring of the second linkage is identical.

As the Applicant has shown, the spring of Sträter is not attached between (1) an anchor point defined on the linkage, or (2) a pivot point. Therefore, the elements in Claim 1 dealing with the spring in both the first linkage and the second linkage are not met. As a result, the Applicant submits that Claim 1 is distinguished from Sträter.

The Examiner further states that Sträter discloses first and second pivots which comprise a first axle (14) and a second axle (14), respectively, a first ring (19) disposed

around the first axle and a second ring (19) disposed around the second axle and wherein the springs are attached to the pivots via an attachment (21, 23 and 24) to the rings. In response, the Applicant points out that reference (14) in Sträter refers to a bolt (see column 5, line 33) whereas the axles 5 and 6 in the present application are rings as shown in Figure 2 of the present application. Additionally, what the Examiner refers to as a first ring (19) as disclosed in Sträter is in actuality the brake shoe as can be see from column 5, lines 43 through 46. This is not a ring, but a segmented arc. Further, the Applicant respectfully disagrees that the springs shown in Sträter are "attached to pivots via an attachment to the rings". In the case of Sträter, the springs are, as previously discussed, compressed between the shoulders of the guide rods. In addition, what the Examiner refers to as attachments 21, 23 and 24 are in reality not even attached to the "ring" (brake shoe) 19. Element 24 in Sträter is a pivot pin which pivotally connects one end of the guide rod to turning member 23, which in turn is pivotally attached to spreading member 21. Spreading member 21 is the element which pushes the ends of the arc-segmented brake shoe 19 away from each other, thereby widening the gap in the brake shoe. As such, there is no actual physical attachment between elements 21, 23 and 24 in Sträter and what the Examiner refers to as the "ring" 19, and, as such, no attachment between the spring and the ring.

With respect to the cable element, Sträter utilizes cables (15 and 16) which are actuated by a user to pull the pivot point between one segment of guide rod (25) and turning lever 23 into a position which causes the spreading member (21) to rotate in the gap in brake shoe (19) such as to make the gap smaller (thereby releasing the brake shoe

from frictional engagement with the pivot). In this case, the cable works against spring (25) which is exerting a force to rotate spreading member (21) in such a manner as to make the gap wider. When the cable is pulled, the turning member is rotated such that the gap is made smaller, thereby allowing the linkages to rotate about the pivot points (i.e., the outer circumference of the brake shoe is no longer frictionally engaged).

This differs from the cable of the present invention which is attached between the two pivot points (i.e., around the first ring and the second ring as claimed in Claim 3). The purpose of the cable in the present invention is to keep the first and second rings in the same position relative to each other and relative to the horizon as the linkages are rotated. In the present invention the first ring, which is the ring nearest the base, is fixed and is unable to rotate. The second ring is able to rotate about pivot point B and is attached to the first ring via the cable such that when the linkages rotate around the rings, the rings stay stationary with respect to the horizon (i.e., neither ring rotates). Therefore, the limitations of Claims 3 and 4 are not met by the cable disclosed in Sträter.

## II. Claim 11 Is Patentable Over Sträter in view of Vlasak, Souder, Jr., et. al, or Spadea

Claim 11 is dependent upon Claim 10 and merely illuminates various attachments that can be attached to the end of a mechanical arm, several of which are disclosed in Vlasak, Souder, Jr. et al., and Spadea. However, the arguments above with respect to the patentability of the parent claims of Claim 11 over Sträter apply here as well and will not be repeated for the sake of brevity. Should the arguments above with respect to Sträter

be found to be convincing with respect to the patentability of Claims 1-2 and 7-10, then Claim 11 will be patentably distinguishable as well, being dependent from Claim 10.



### III. Conclusion

Sträter does not disclosed key elements of the invention as claimed in Claims 1-2 and 7-10, as discussed above. Therefore, the applicants request a reversal of the Examiner's rejection thereof under 35 U.S.C. § 102(b).

Respectfully submitted,



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## Claims Appendix

1. A mechanical arm comprising:
  - a base;
  - a first linkage pivotally attached to said base at a first pivot;
  - a second linkage pivotally attached to said first linkage at a second pivot;
  - a first spring attached between an anchor point defined on said first linkage and said first pivot; and
  - a second spring attached between an anchor point defined on said second linkage and said second pivot.
  
2. The arm of Claim 1 wherein said first and said second pivots comprise:
  - a first axle and a second axle respectively; and
  - a first ring disposed around said first axle and a second ring disposed around said second axle;
  - wherein said first spring is attached to said first ring and said second spring is attached to said second ring.
  
3. The arm of Claim 2 further comprising a cable, disposed around said first ring and said second ring, such that movement of said first linkage about said first pivot causes said second ring to rotate about said second axle such as to keep the relative position of said second ring with respect to a horizontal plane constant.

4. The arm of Claim 3 wherein said first ring is unable to rotate with respect to a horizontal reference.
5. The arm of Claim 4 wherein said springs are attached to said pivot points via a hole disposed in said rings.
6. The arm of Claim 4 further comprising:
  - a first cable, attached at one end to said first spring and wherein the opposite end of said first cable is wrapped around and unmoveably attached to said first ring; and
  - a second cable, attached at one end to said second spring and wherein the opposite end of said second cable is wrapped around and unmoveably attached to said second ring.
7. The arm of Claim 2 wherein said first axle and said second axle are hollow.
8. The arm of Claim 4 wherein said base and one end of said first linkage are rotatably attached to said first axle and further wherein the other end of said first linkage and one end of said second linkage are rotatably attached to said second axle.

9. The arm of Claim 4 wherein said first and said second springs and said first and said second rings are hidden from view within said first and said second linkages.
10. The arm of Claim 8 further comprising an apparatus, said apparatus being rotatably attached to the other end of said second linkage.
11. The arm of Claim 10 wherein said apparatus is selected from a group consisting of a lamp, a computer monitor, a lab instrument and a microphone.
12. The arm of Claim 10 further comprising an electrical cord for providing electrical power to said attachment, said electrical cord being channeled around said second pivot and wherein said electrical cord has a coiled portion disposed in said first linkage, such that movement of said second linkage with respect to said first linkage cause said coiled portion of said electrical cord to expand and contract.
13. The arm of claim 9 wherein said linkages are constructed of a material selected from a group consisting of metal and plastic.

#### Evidence Appendix

No additional evidence is being submitted.

### Related Proceedings Appendix

There are no related proceedings.